

Distribution of cranes in Hulunber Grassland and Daxing'an Mountains Forest Region in Inner Mongolia

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Abstract The Daxing'an Mountains and Hulunber Grassland are located in the northeastern border area of China. This region covers a large area of rich biodiversity. The natural environment here is well protected because of low pressure of human activity. There are 5 species of cranes here. They are Red-crowned crane (*Grus japonensis*), White-napped crane (*Grus vipio*), Siberian White crane (*Grus leucogeranus*), Grey crane (*Grus lifordi*) and Demoiselle crane (*Anthropoides virgo*). Red-crowned crane is a breeding species that is widely distributed in this area. The main breeding population of this species is in Heilongjiang Province. They migrate to the south of China in winter. White-napped crane, Grey crane, Demoiselle crane are also summer birds. It remains unknown if Siberian White crane breeds here. Since the population of Red-crowned crane, White-napped crane, Siberian White crane in China are at the edge of endangering, so they are listed in the namelist of national protected species. But Grey crane, Demoiselle crane have a larger population, and are widely distributed.

Key words: Hulunber Grassland, Cranes, Habitat

Introduction

Animal Research Institute of the Chinese Academy of Sciences, Forest Program Institute of Daxing'an Mountain, Inner Mongolia University, Inner Mongolia Farming and Animal Husbandry College, Northeast Forestry University, etc. have conducted a series of investigation and studies on the fauna, population of economic-valued species and mouse pest control in Inner Mongolian Daxing'an Mountains Forests and Hulunber Grassland. A few monographs and papers on it were published. But specific studies and thorough investigation have not been done on cranes, except for a few reports. Yin Ruixue (1992) reported the distribution of cranes in Daxing'an Mountains Forests. Tong Yongcheng and Tong Junchang reported the distribution of cranes in 4 eastern leagues in Inner Mongolia. Haris, a scientist of International Cranes Foundation reported the distribution of cranes in Dalai Lake area. The distribution of cranes in Inner Mongolian Hulunber Grassland and Daxing'an Mountains Forests was surveyed in the past a few years.

Natural environment

Inner Mongolian Daxing'an Mountains Forests refers to the part of Daxing'an Mountains which is a compass of competency of Inner Mongolia Autonomous region. It's located in the south to Yong'an Mount,

North to Aer Mount, east to Eerguna River (the Sino-Russia boarder), and west to Jiagedaqi Forest Region belonging to Heilongjiang Province. In the south, the Teerino Mount is the highest peak that shoots up to 1 725 m above sea level in the compass of the Aer Mount Forestry Bureau. In the north, Aokelidui Mount is the highest mountain, which is 1 530 m above sea level, lying in the compass of Along Mount Forestry Bureau. In the east, the main rivers, Bila River, Nomin River and Gen River flow into Nenjiang River. In the west, Niuer River, Gen River and Derbuer River flow into Eerguna River. From the east and north, Hulunber Grassland is gradually derived from a transitional zone of forest-grassland to form a part of the Great Mongolian grassland, which joined Dong Fang Province and Suhebate province of the Republic of Mongolia in the west which are bounded by Xing'an League.

In the Hulunber Grassland, Yimin River, Huihe River, Hailaer River and Moergele River are the main rivers. Dalai Lake, the largest freshwater lake in the northeastern China, lying in the west of the grassland, extends about 100 km from the north to the south, 40~50 km from the east to the west. Kelulun River flows into Dalai Lake from the Republic of Mongolia. Dalai Lake and Beier Lake are linked by Wuexun River and Wulan Lakelet. Beier Lake is the Boundary Lake of China and Mongolia.

The main vegetation is Coniferous Forest of Subfrigid Zone, Featured by conifer species like *Larix gmelini* and *Pinus sylvestris* var. *mogolica*. *Betula platyphoylla*, *Vaccinium vitisidolaca* and *Ledum palud-*

tre, etc. are the other building-group and dominant species. They belong to Dauli plant flora. The Mongolian Dauli plant species are dominant components in the Hulunber Grassland flora.

Daxing'an Mountains is the coldest area in the north border area of China. The annual temperature which is averaged below 0 °C and changes from -1 °C to -5 °C, from southeast to northwest. The climate has the typical characters of continental climate, but is strongly influenced by monsoon. In winter, influenced by Siberia cold current, the climate is extremely frigid. The winter may last for 9 months. The average temperature in the coldest month (January) is -25~30 °C. The absolute lowest temperature is below -45 °C, once for -52.3 °C recorded in Mohe. The warm season is very short. Summer (average

temperature ≥ 22 °C) is not more than one month and major area has no true summer. The months in which the daily temperature is 10 °C last for only 70-100 d. Thus the annual discrepancy and daily discrepancy of temperature show great disparity.

The Daxing'an Mountains goes from the northeast to the southwest, so it prevents the Pacific monsoon from intruding into the continent. At the same time, it resists the Mongolian cold current coming from Siberia. Therefore, the climate in the eastern and the western part of the mountains exhibits distinct difference. The climate is warm in the east of mountains, but cold and arid in the west where belongs to semi-arid grassland climate. Table 1 shows some climate indexes.

Table 1. Three Regional climate characters in Hulunber League

Areas	Annual mean temperature /°C	Precipitation /mm	Evaporation /mm	AAT* ($\geq 0^{\circ}\text{C}$) /°C	AAT* ($\geq 10^{\circ}\text{C}$) /°C	Frost-free period /d	Annual sunshine /h	Total solar radiation /(MJ·m ⁻² ·a ⁻¹)
Eastern mountainous area	0~2	400~500	1 446~1 497	2 747~2 820	2 337~2 413	120~130	2 800	5 267~5 341
Western mountainous area	-3~0	250~380	1 300~1 900	1 179~2 674	1 856~2 274	80~120	3 000	5 026~5 720
Daxing'an Mountains	-5~2	400~500	1 790~2 433	1 790~2 433	1 235~2 014	40~85	2 700	4 670~5 083

Notes: AAT* ---- Annual accumulated temperature

Animal fauna in Daxing'an Mountains belongs to the Daxing'an Mountains sub-region, Mongolia-Xinjiang Region that is featured with mammalian species like *Alces alces*, *Gulo gulo*, *Rangifer tarandus*, *Lepus timidus* etc. and avian species like *Tetrao parvirostris*, *Lyrurus tetrix*, *Plectrophenax nivalis* and

Nyctea scandiaca etc.

Animal fauna in Hulunber Grassland belongs to eastern grassland sub-region, Mongolia-Xinjiang Region that composes with typical grassland species like *Procapra gutturosa*, *Carnis lupus*, *Vulpes vulpes*, *Mustela eversmanni*, *Marmota sibirica*, *Dipus sagitta*, *Myosphalax aspalax*, *Otis tarda*, *Alauda arvensis*, *Oenanthe isabellina*, *Melanocorypha mongolica*, *Calandrella cheleensis*, etc. Hulunber Grassland is the main distributing region of *Procapra gutturosa*.

Cranes habitat

Different crane species needs different habitat, especially breeding habitat. The cranes habitat in Inner Mongolian Daxing'an Mountains and Hulunber Grassland can be divided into two types.

Grassy marshland-grassland type

Grey crane and Demoiselle crane are the cranes that breed in grassy marshland-grassland. They build simple nests in covert sits. Grassy marshland-

grassland can be classified.

Hilly area-grassy marshland

The main plants are *Carex kirganica*, *Sanguisorba officinalis*, *Calamagrostis epigejos*, *Aneurole pidium*. Hilly area-grassy marshland occurred in the upper Daxing'an Mountains slope running from east to west, gully area and gentle platforms. Being continuous to forest, the hilly area always distributes inlaying with forest.

Lowland-grassy marshland

The main plant species are *Salix*, *Agrostis alba*, *Sanguisorba officinalis*, *Aneurole pidium*, *Bolboschoenus maritimus*, *Calamagrostis epigejos*. Lowland-grassy marshland widely distributes in the riverbanks, flood land, lake beach, sunken areas among hills, plain lowland where the surface water is rich and connecting with groundwater in Hulunber League.

Warm grassy marshland-grassland

The main plants are *Aneurole pidium chinense*, *Calamagrostis epigejos*, *Filifolium sibiricum*, *Lespedeza bicolor*. The warm grassy marshland-grassland belongs to regional grassland. It is the most eastern type in the Chinese temperature zone grassland. In addition, there is warm dry grassland; the representative plant species is *Aneurole pidium chinense*.

Wet marshland

Siberian White crane, White-napped crane and Red-crowned crane are the cranes which breed in wet marshland. The main wet marshland in Daxing'an Mountains Forests area and Hulunber Grassland is as follows.

Hilly marshland

Hilly marshland covers a very large area in Daxing'an Mountains. It is often formed in areas where water float is blocked. Owing to the inconvenient traffic, human seldom disturbs. Therefore, this kind of environment is very ideal for cranes to breed. Main plant species are *Lobesia spp.*, *Carex kirganica*, *Deyeaxia angustifolia*, *Poa subfastigiata*, *Lemna minor*, *Carex megeriana*, *Iris kaempferi*, etc.

Lake-marsh

In the Daxing'an Mountains Forests and Hulunber Grassland, there are lakes of different sizes and large marshland areas formed around lakes, such as Daerbin Lake in Bilahe Forestry Bureau, Niuer Lake in Along Mount Forestry Bureau, Tianchi in Aer Mount Forestry Bureau, etc. There are many large reed marsh areas between Dalai Lake and Wulan Lakelet.

This is also ideal breeding habitat of cranes. Its dominant plant species are *Phragmites australis*, *Potamogeton natans*, *Saussurea japonica*, etc.

River-valley-marshland

There is crisscross river network in this area, such as Derbu River, Jiliu River, Bila River, Beida River, Yimin River, Hui River, etc. Because of the small relative drop height, commonly, current flow very slowly and sometimes overflow accidentally, thus forms the larger marshlands, especially along the Sino-Russian boundary river, Heishantou of Erguna River and the area near Huiyetu. *Phragmites australis*, *Typha davidiana*, *Sparganium simplex*, etc. are the representative plant species. In addition, there are many shrub clusters, dominantly willow clusters. Because human seldom disturb near the boundary river and places where national boundary has not been decided, such environment is often taken as ideal breeding and resting habitats by cranes.

Cranes distribution

We found 5 cranes species in this area through field investigation a few years in the past (Table 2).

Table 2. Results of the investigation

Species	Observed number	Observing time	Observing sites	Remarks
White crane	15	Sept. 16, 1984	Heishantou of Erguna River	
(<i>Grus leucogeranus</i> Pallas)	2	Sept. 27, 1986	southwest to the Baimakan Forest Farm of Mangui Forestry Bureau	In marshland
	2	April 20, 1986	Menggui Forest Farm of Mangui Forestry Bureau	
Red-crowned crane	5	May, 1988	Dalai Lake	On the south bank
(<i>Grus japonensis</i> Muller)	2	April 23, 1990	Xiaoerhong Forest Farm of Bilahe Forestry Bureau	Building a nest
	1	June, 1990	Wuerxun River	Shot
	2	March 12, 1991	Kumo Forest Farm of Dauangshu Forestry Bureau	
	1	Sept. 21, 1991	Daomu Forest Farm of Genhe Forestry Bureau	Nest
	1	June, 1997	Kerlun Lake	On the bank
	2	March 17, 1990	Bila River	First seen
White-napped crane (<i>Grus vipio</i> Pallas)	10 pairs	May, 1990	Zhawenqihan Forest Farm & Zhawenhe Forest Farm	In a mixed group of Grey crane
	4 (2 young)	June 11, 1990	Zhawenhe's Fire Station of Bila River Forestry Bureau	
	4	Sept. 15, 1993	Hui River mouth in Ewenke Autonomous Region	
	3	May 22, 1985	Manzhouli	
Grey cranes (<i>Grus lifordi</i> Sharper)	2 eggs	April, 1991	Kuduer Forestry Bureau	220~230 g in weight, 12~13 cm × 5~6 cm in length.
	1 young	Sept. 17, 1991	Kudur Forestry Bureau	
	10	May 14, 1985	Dalai Lake & Xihe Fishery	
	2	May 15, 1985	Dalai Lake & Xihe Fishery	
	1	May 16, 1985	Dalai Lake & Xihe Fishery	
Demoiselle crane (<i>Anthropoides virgo</i> Linnaeus)	4	May 20, 1985	Dalai Lake & Xihe Fishery	
	4 (2 young)	June 15, 1987	Yimin Commune of Ewenke Autonomous Region	
	1	May, 1991	47 km from Yakeshi	
	6	May 12, 1991	Xinbaerhuyouqi and Sehan Commune	
	7	June, 1997	Beier Commune near Beier Lake	

Results and discussion

Field investigations were conducted for several years. It's discovered that some crane species are widely distributed in Daxing'an Mountains Forests and Hulunber Grassland besides White crane. We have found the nests of Red-crowned crane, White-napped crane, Grey crane, and Demoiselle crane. It indicates they breed in this area.

Cranes recorded were found in the Hulunber Grassland and Inner Mongolian Daxing'an Mountains, but we did not deeply investigated and studied their habitat characters and ecological behaviors.

The observation of the past a few years have indicated that cranes are widely distributed in the areas stated above, owing to vast area, abound natural resources, and little human impacts. The crane population is large because people are forbidden to access the undelimitative boundary area between China and Russian.

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